

Evaluating Atmospheric Water Generation Technology

The feasibility of producing water from the air.



Water from air

Atmospheric water generators (AWGs) produce potable water from ambient air. These units range from home-based units that can produce 1 to 20 liters of water per day to commercial-scale units capable of 1,000 to over 10,000 liters per day. These water production rates are highly dependent upon the amount of water vapor in (i.e., humidity), and temperature of the air. The most commonly used AWG systems employ condenser and cooling coil technology to pull moisture from the air in the same way a household dehumidifier does. Significant quantities of energy can be required to operate these condenser and fan systems, but recent technological advancements have substantially improved the energy-water ratio which increases the feasibility of using these systems to help improve the Nation's water infrastructure.

EPA interest in AWG technology

EPA has explored the feasibility of AWG systems for different scenarios in recent years. For instance, EPA's Office of Land and Emergency Management examined the application of AWGs to supplement or provide drinking water during Superfund response actions. Although they found the energy cost of AWG water production to be higher than the cost of water from a public water supply, they also noted that AWG water production has a lower cost than providing bottled water in an emergency or alternative scenario where a public water supply is not available.

Recent high-profile natural disasters, such as Hurricane Harvey, and public water infrastructure failures, such as those that occurred in Flint, Michigan, have increased the interest in AWG technology as both emergency and longer term supply solutions.

CRADA partnership with Water Gen

In September 2017, EPA's Office of Research and Development announced a new Cooperative Research and Development Agreement (CRADA) developed to further advance the science of AWG, and assess its potential as a water production and supply solution for different scenarios.

In January 2018, EPA signed a CRADA with Water Gen, a corporation developing cutting-edge AWG technology, to evaluate their GEN-350 system <http://water-gen.com/>. The GEN-350 is capable of generating nearly 600 liters of water per day in optimal temperature and humidity conditions. A test unit was shipped to EPA lab facilities for collaborative research purposes.

EPA and Water Gen will engage in two primary

collaborative research tasks. First, an assessment of the quality of water produced and any potential health risks under real-world operating conditions. Of particular interest is an assessment of product water quality prior to any secondary treatment system installed. The primary health concern is opportunistic pathogens, such as *Legionella* and *Mycobacterium*, that are commonly associated with drinking water infrastructure. Second, using life cycle assessment (LCA) techniques, EPA and Water Gen will work together to construct and evaluate different AWG deployment scenarios where AWG may provide a viable water source, and to compare AWG against alternative options, such as bottled water, in those scenarios.

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